



Region of Waterloo

PUBLIC HEALTH

# RADON

## What you need to know

- ✓ What RADON is
- ✓ The health effects
- ✓ How to test your home
- ✓ How to reduce your risk

Protect your health. Test your home.  
[www.regionofwaterloo.ca/RADON](http://www.regionofwaterloo.ca/RADON)

# RADON information

## What is radon?

Radon is a radioactive gas that is formed by the breakdown of uranium, a natural radioactive material found in soil, rock and groundwater.

When radon is released from the ground into the outdoor air, it gets diluted to low concentrations and is not a concern. However, in enclosed spaces (e.g. basements) radon can sometimes accumulate to high levels, which can present a health risk. Where a home or building touches the ground, radon can get in anywhere it finds an opening including: cracks in the foundation, spaces around pipes, sump holes and floor drains, etc.



Source: Health Canada, 2011.\*

### HOME – Definition

In this directory, home refers to any place a person may live, including apartments, houses, condominiums, townhouses, etc.

## The health effects of radon

Radon naturally breaks down into radioactive particles that can get trapped in your lungs when you breathe. When inhaled, these particles can get deep into the lungs and damage lung tissue, which can lead to lung cancer over the course of your lifetime. Long-term exposure to high levels of radon may increase the risk of developing lung cancer.



**According to Health Canada, radon exposure is linked to roughly 16% of lung cancers in Canada, and is the second leading cause of lung cancer after smoking.**

## Who is at risk?

Radon is colourless, odourless and tasteless, therefore the only way to know the level of radon is to test for it.

Higher levels of radon are typically found in basements or on first and second floors of homes or buildings.

### **The risk from radon exposure is long term and depends on three things:**

1. Level of radon in your home or building
2. Length of exposure to radon
3. Your smoking habits or exposure to second-hand smoke

## Radon, smoking and lung cancer

People who are exposed to elevated levels of radon and who smoke or are exposed to second-hand smoke, have a higher risk of developing lung cancer than people who are exposed to radon alone. For smokers, and people exposed to second-hand smoke, the risk of lung cancer is increased due to the combined effects of radon and smoking. For example, if you are a lifelong smoker but are not exposed to radon, your risk of getting lung cancer is one in ten. If you are also exposed to a high level of radon, your risk becomes one in three.

## QUICK FACTS

- Radon gas is everywhere
- Radon is colourless, odourless and tasteless
- The only way to know the level of radon in your home is to test for it
- According to Health Canada, you should take action if your home tests above 200 Bq/m<sup>3</sup>
- About 7% of homes in Canada have radon levels above the Canadian guideline of 200Bq/m<sup>3</sup>
- Radon is the second leading cause of lung cancer after smoking
- Approximately 16% of lung cancers in Canada are related to radon exposure
- The higher the long-term exposure to elevated radon, the higher the risk of getting lung cancer

### **If you are a smoker:**

- Make your home smoke-free
- Visit the Region of Waterloo's "Quitting Smoking" website: [www.regionofwaterloo.ca/smoking](http://www.regionofwaterloo.ca/smoking)
- Contact the Smokers' Helpline (Canadian Cancer Society) to get started: [www.smokershelpline.ca](http://www.smokershelpline.ca) or 1-877-513-5333
- Contact the Lung Association's Helpline for questions and/or support 1-888-344-LUNG (5864)

## How can I test my home for radon?

Testing your home for radon is easy. Health Canada suggests that you use a long term radon detector for a **minimum of three months**. There are two options if you want to test your home for radon:

### 1. Buy a do-it-yourself radon test kit

- Can be purchased in some retail stores that sell building, hardware or health care products
- Can also be purchased online through companies that specialize in home improvements and radiation safety
- The kits include instructions on how to set up the radon test and how to send it back to a lab for analysis when the testing period is over
- Closely follow the instructions on how to set up the test in your home
- Cost of testing ranges from \$25 – 170

### 2. Hire a radon testing company

- If you hire a testing company, you should make sure it is certified and will conduct a long-term test for you
- For a list of certified radon testing companies visit: <https://c-nrpp.ca/find-a-professional>

## Tips for the “do-it-yourself” radon tester

Follow the instructions that come with the test kit carefully.

- Perform a long term test for a minimum of three months
- Test in the lowest lived-in level of your home where you spend at least 4 hours per day
- Place the kit away from drafts, high heat, high humidity, and exterior walls
- Do not test in the bathroom or kitchen
- Make sure nothing touches the detector to ensure accurate reading of radon levels
- Keep test kit uncovered
- Reseal the package and send it back to the lab for analysis once the test is complete (not applicable for continuous radon monitor)

**Health Canada recommends that actions should be taken to lower the level of radon in a home or building when the radon level exceeds 200 Bq/m<sup>3</sup>**

—see page 6 for more information

## Common methods for measuring radon

Health Canada recommends testing for a minimum of three months, ideally between September and April, when windows and doors are typically kept closed.

### Passive Alpha Track Detectors

These detectors use a small sheet of special film enclosed in a container with a filter-covered opening. Passive alpha-track detectors are exposed to the air in a home for a period that can range from one month to one year. Passive alpha-track detectors must be returned to a laboratory for analysis.

**Length:** long-term

**Cost:** \$25–40\*



### Electret Ion Chamber

This method uses a plastic canister containing a disk called an “electret” with an electrostatic charge. When exposed to air, the change in the electret’s charge is read to determine the radon level. Short-term (a few days or weeks), and long-term (several weeks or months) tests are available. Electret ion chambers may be read in the home or mailed to a lab for analysis.

**Length:** short-term or long-term

**Cost:** \$50–75\*

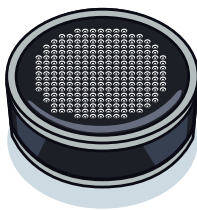


### Charcoal Detectors

These devices consist of a container filled with charcoal and covered with a screen and filter. They are exposed to the air in your home for a specified time period (usually 2–7 days), sealed and then sent to a laboratory for analysis.

**Length:** short-term

**Cost:** \$25–40\*



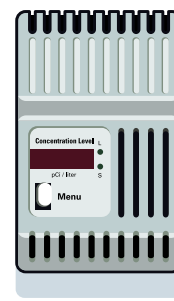
### Continuous Monitors

These devices typically measure radon over a series of minutes and usually report the results in hourly increments. Results are normally available in the home.

The cost of continuous monitor measurements is generally more expensive than other devices.

**Length:** short-term and long-term

**Cost:** \$130–170\*



\*Cost estimates at time of publication

## What should I do if my home tests above Health Canada's recommended level of 200 Bq/m<sup>3</sup>?

### Take actions to reduce your radon levels:

There are different methods to reduce the level of radon in a home or building. The effectiveness of the radon reduction method that is used will depend on the unique characteristics of a home or building, the level of radon, the entry routes for radon, and the quality of work done. A single method may reduce radon levels but, in some cases, a combination of methods may be required to get the desired results.

Many radon reduction measures require installation by a professional contractor, including:

- Closing major entry routes for radon (including: sumps that are open, floor drains, exposed soil, voids in concrete block walls, etc.)
- Reducing forces that draw radon into the home
- Depressurizing the soil around the foundation
- Sealing any remaining entry routes for radon

Contact a certified radon service provider for more information about the above methods and reducing your risk.

**For more information about reducing your radon levels, please refer to:  
"Radon: A Guide for Canadian Homeowners":**

[http://publications.gc.ca/collections/collection\\_2008/cmhc-schl/NH15-180-2007E.pdf](http://publications.gc.ca/collections/collection_2008/cmhc-schl/NH15-180-2007E.pdf)

## How soon to take action to reduce radon levels

If the radon level in your home is above the Canadian guideline of 200 Bq/m<sup>3</sup> you should take action.

The longer the exposure to elevated levels of radon, the higher the risk of getting lung cancer.

These guidelines should be followed to reduce your risk.



> 600 Bq/m<sup>3</sup>  
Remediate within  
1 year



200–600 Bq/m<sup>3</sup>  
Remediate within  
2 years



200 Bq/m<sup>3</sup> or less  
No action required

Source: Health Canada, 2011.\*

# Finding a radon contractor

Some contractors focus on radon measurement, some focus on radon mitigation, and some will help coordinate both measurement and mitigation. Look for a certified radon service provider.

## A radon contractor should:

- Verify the level of radon in your home
- Assess ways to lower the level of radon in your home
- Provide recommendations for reducing radon in your home

### MITIGATION/REMEDIATION

#### Definition

Radon mitigation/remediation refers to any process used to reduce the levels of radon in a home or building.

## Notes:

---

---

---

---

---

---

---

---

---

---

## Look for a company that:

- Is a member of a the American Association of Radon Scientists and Technologists (AARST) or the Canadian Association of Radon Scientists and Technologists (CARST)
- Is certified/trained to provide radon measurement and/or mitigation services
- Has experience with radon testing and/or mitigation
- Provides long term radon testing
- Is familiar with Health Canada’s measurement protocols
- Inspects your property before giving you a price quote or beginning any work
- Gives you a written report, and an action plan of the work they are going to carry out
- Employs qualified, well-trained radon professionals
- Informs you about the work they are doing
- Completes a post-mitigation test

### Certified radon service providers in

Canada: <https://c-nrpp.ca/find-a-professional>

## For more information about RADON

### List of resources for contractors:

#### Information on certification programs:

<https://c-nrpp.ca/find-a-professional>

#### Reducing Radon Levels in Existing Homes: A Canadian Guide for Professional Contractors

[http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radon\\_contractors-entrepreneurs/index-eng.php](http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radon_contractors-entrepreneurs/index-eng.php)

(click on "order a copy")

#### Region of Waterloo Public Health

[www.regionofwaterloo.ca/RADON](http://www.regionofwaterloo.ca/RADON)

519-575-4400 TTY 519-575-4608

#### Health Canada

[www.healthcanada.gc.ca/radon](http://www.healthcanada.gc.ca/radon)

1-800-0-CANADA (1-800-622-6232)

#### Ontario Lung Association

<https://lungontario.ca/protect-your-breathing/what-is-radon-gas-radon-in-your-home>

1-888-344-LUNG (5864)

*This document is available in alternate formats upon request.*

*Created January 2013 / Last Revised October 2019*



Region of Waterloo  
PUBLIC HEALTH

**RADON**  
Protect your health. Test your home.

*\* Source: Radon: What you need to know. Health Canada, 2011. Reproduced with the permission of the Minister of Health, 2012.*